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# PATENT SPECIFICATION

805,325

Inventor :—ARCHIE JOHN HIRST.



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International Classification :—B61f. F06f.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Bolster Supports for Bogies Incorporating Rubber or the like Springs.

We, METALASTIK LIMITED, a British Company, of Evington Valley Road, Leicester, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention concerns spring supports for the bolster of a bogie wherein the springs are of rubber or the like material. The present invention relates to a spring support (hereinafter referred to as a support of the type set forth) comprising a bolster of a bogie, a bogie frame and, at respective ends of the bolster, a pair of blocks of rubber-like material which support the bolster from the bogie frame, the blocks of each pair being in combined shear and compression under the vertical load applied to them by the bolster and having their compression axes substantially normal to the bolster.

Supports of the kind set forth are known wherein the blocks of rubber or the like material are arranged in pairs one on each side of the bolster the pair of blocks being arranged in shallow, inverted V-formation.

The present invention broadly has for its object to provide an arrangement having certain advantages over the known constructions of supports of the kind referred to. More specifically the present invention has for its object to provide a spring support wherein the overall length is reduced compared with known arrangements. As applied to the known constructions of supports of the kind referred to the overall length has reference to the distance between the rubber or the like blocks at the free ends of the V-formation.

[Price 3s. 6d.]

Price 4s 6d

According to the present invention the spring support is characterised in that the blocks of each pair are spaced lengthwise of the bolster and that the blocks overlap so that their compression axes, within the length of the blocks, are in X-formation.

The support blocks are close together and it is preferably arranged that the bolster is hollow, the support blocks lying mainly with the bolster.

According to a further feature of the invention each block of each pair comprises a pair of rubber-like elements and a metal plate sandwiched therebetween, the elements of each pair of blocks being bonded or similarly integrally united with the intermediate plate, the intermediate plates of the pair of blocks being rigidly coupled together. Preferably said metal plates are respectively normal to the compression axes of their associated blocks and are integral with a coupling plate extending between the pair of blocks.

The present invention also includes within its scope bogie carriages incorporating bolster supports as set forth above.

A practical application of the present invention will be now described, by way of example only, with reference to the drawings accompanying the Provisional Specification whereof :—

Fig. 1 is a sectional end view on the line I—I of Fig. 2 showing a bolster support for a bogie carriage in accordance with this invention, and

Fig. 2 is a plan view of the arrangement of Fig. 1.

Referring to the drawings : the bolster is indicated generally by the reference numeral 5 and the bogie frame by the reference numeral 6. The spring support which is about

to be described is associated with one end of the bolster and it is to be understood that a similar spring arrangement is provided at the other end.

5 As shown in Fig. 2 the bolster 5 is of hollow construction and stiffening plates 7 are provided which divide the end of the bolster into a pair of cells within each of which there is a rubber or the like support block generally indicated at 8.

10 The blocks 8 are in combined shear and compression under the vertical load of the bolster and, as shown in Fig. 1, the compression axes, which are indicated at C are upwardly inclined, the pair of axes within the blocks being arranged in X-formation.

15 It will be noted from Fig. 2 that the compression axes are inclined with respect to the longitudinal axes of the carriage.

20 The upper end of each rubber or the like block 8 abuts a cross-plate 9 lying within each cell and secured, as by welding for example, to the plates 7 and the bolster 5. The cross-plates are suitably inclined so that they are substantially normal to the compression axes C of the blocks.

25 The sole bar 10 carries a cantilever plate 11 which is substantially parallel with the cross-plate 9 of the outer block 8 and the lower end of said block abuts the cantilever plate.

30 The transoms 6 of the bogie frame are connected by a bridge piece 12 which carries an upstanding plate 13, corresponding to the cantilever plate 11, and the inner block 8 abuts the plate 13 at its lower end and, as in the arrangement of the outer block, the plates 9 and 13 are substantially parallel and are normal to the compression axis of the associated block 8.

40 Each block 8 comprises a pair of rubber-like elements 14 and a metal plate 15 sandwiched therebetween, the plate 15 being provided to prevent undesirable distortion of the rubber blocks 8 as more fully set forth in Specification No. 648,516. It is to be understood that each of the rubber elements 14 may be provided with metal interleaves as set forth in Specification No. 648,516. To ensure that relative angular movement of the metal interleaves of each support block 8 is substantially reduced or eliminated the sandwich plate 15 of the pair of blocks are rigidly coupled together. As shown, each sandwich plate 15 is integral with a coupling plate 16 and therefore any tendency for relative angular movement of the metal interleaves of one support block is transmitted to the other support block and resisted thereby. Consequently said relative angular movement is substantially reduced or eliminated, more particularly since the probable nature of the angular movements for the blocks are in opposition to one another.

With the particular arrangement described with reference to the drawings the bolster lies between the sole bars but in certain circumstances it may be found that the resultant transverse spring base is less than is desired and, in an alternative arrangement, to provide for a wider spring base the sole bar is lowered so that the bolster may pass over it. With this arrangement the pair of spring supports 8 at each end of the bolster may be arranged outside the sole bar. Alternatively, however, it may be arranged that the sole bar passes between the pair of springs, one being beyond the sole bar and the other within the sole bar. This alternative arrangement is illustrated in the accompanying drawings of which Fig. 1 is a sectional end view and Fig. 2 is a plan view of the arrangement. The arrangement will not be described but like parts to the arrangement illustrated in the drawings accompanying the Provisional Specification are indicated by like reference numerals. With either of these arrangements a modified arrangement of stabilising plate 15, 16 would be provided, the general construction being, however, as described with reference to the drawing.

The rubber elements 14 are preferably bonded or similarly integrally united with the plate 15 and similarly the elements may be bonded or similarly united to the metal interleaves referred to.

Although the invention has particular application to supporting a bolster of a bogie carriage nevertheless it is not so limited and may be used on other vehicles or even with stationary loads.

#### WHAT WE CLAIM IS:—

1. A spring support of the type set forth characterised in that the blocks of each pair are spaced lengthwise of the bolster and that the blocks overlap so that their compression axes, within the length of the blocks, are in X-formation.

2. A support according to Claim 1 in which the bolster is hollow and the support blocks lie mainly within the bolster.

3. A support as claimed in Claim 2 wherein each end of the bolster is divided by transverse plate-like members into a pair of cells within each of which lies one of said support blocks.

4. A support according to Claim 3 in which cross-plates or the like extend between, and are secured to, said transverse members and the support blocks abut said cross-plates thereby to support the bolster.

5. A support as claimed in Claim 2, 3 or 4 in which a member extends transversely of, and beneath, the bolster and a support block rests upon said member or upon a plate-like member carried thereby.

6. A support as claimed in Claim 5 wherein said transversely-extending member is a

bridge piece carried by the transoms of the bogie frame.

7. A support as claimed in Claim 2, 3, 4, 5 or 6 in which a support block rests upon a plate-like member projecting inwardly from a solebar of the bogie frame to beneath the bolster.

8. A support as claimed in Claim 1 or any claim appendant thereto in which the bolster is supported by blocks arranged outside the solebar of the bogie frame.

9. A support as claimed in any of Claims 1 to 7 in which each end of the bolster is supported by said pair of blocks, one block of which lies beyond, and the other block within, the solebar of the bogie frame.

10. A support according to any preceding claim in which each block of a pair comprises an intermediate rigid plate substantially normal to the compression axis, said pair of plates being rigidly coupled together.

11. A support as claimed in Claim 10 wherein said intermediate plates are rigidly secured to a coupling plate lying between the pair of blocks.

12. A support as claimed in any preceding claim in which the compression axes diverge as seen in the direction of application of load.

13. A bogie carriage incorporating a spring support according to any preceding claim.

14. A spring support of the kind set forth substantially as hereinbefore described and as illustrated in the accompanying drawings.

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#### PROVISIONAL SPECIFICATION.

#### Improvements in or relating to Bolster Supports for Bogies Incorporating Rubber or the like Springs.

We, METALASTIK LIMITED, a British Company, of Evington Valley Road, Leicester, do hereby declare this invention to be described in the following statement :—

This invention concerns spring supports wherein the springs are of rubber or the like material and while the invention is of general application it is particularly concerned with a support for the bolster of a bogie carriage. The present invention relates to a spring support (hereinafter referred to as a support of the kind set forth) comprising a load-carrying member (such as a bolster of a bogie carriage) the support frame (such as the bogie frame) and blocks of rubber or the like material which are in combined shear and compression and each of which resiliently supports the load-carrying member from the frame.

Supports of the kind set forth are known wherein the blocks of rubber or the like material are arranged in pairs one on each side of the load-carrying member (e.g. the bolster) the pair of blocks being arranged in shallow, inverted V-formation.

The present invention broadly has for its object to provide an arrangement having certain advantages over the known constructions of supports of the kind referred to. More specifically the present invention has for its object to provide a spring support wherein the overall length is reduced compared with known arrangements. As applied to the known constructions of supports of the kind referred to the overall length has reference to the distance between the rubber

or the like blocks at the free ends of the V-formation.

According to this invention the spring support of the kind set forth is characterised in that the support blocks are arranged in pairs with their compression axes in X-formation.

According to a feature of the present invention, as applied to a spring support for the bolster of a bogie-carriage, the support blocks are arranged in pairs near each end of the bolster so that each block is separately loaded and the compression axes of each pair of blocks are in X-formation.

The support blocks are offset one from another and close together and it is preferably arranged that the load-carrying member (or bolster) is hollow, the support blocks lying mainly within said member.

According to a further feature of the invention each of the pair of support blocks comprises a pair of rubber-like elements and a metal plate sandwiched therebetween, the pair of elements being bonded or similarly integrally united with the intermediate plate, the plates of the pair of blocks being rigidly coupled together. Preferably said metal plates are respectively normal to the compression axes of their associated blocks and are integral with a coupling plate lying between the pair of blocks.

The present invention also includes within its scope bogie carriages incorporating spring supports as set forth above. A practical application of the present invention will now be described, by way of example only, with

reference to the accompanying drawing whereof:—

Figure 1 is a sectional end view on the line I—I of Figure 2 showing a bolster support for a bogie carriage in accordance with this invention; and

Figure 2 is a plan view of the arrangement of Figure 1.

Referring to the drawings: the bolster is indicated generally by the reference numeral 5 and the bogie frame by the reference numeral 6. The spring support which is about to be described is associated with one end of the bolster and it is to be understood that a similar spring arrangement is provided at the other end.

As shown in Figure 2 the bolster 5 is of hollow construction and stiffening webs 7 are provided which divide the end of the bolster into a pair of cells within each of which there is a rubber or the like support block generally indicated at 8.

The blocks 8 are in combined shear and compression and, as shown in Figure 1, the compression axes, which are indicated at C, are upwardly inclined, the pair of axes being arranged in X-formation.

It will be noted from Figure 2 that the compression axes are inclined with respect to the longitudinal axes of the carriage.

The upper end of each rubber or the like block 8 abuts a cross-plate 9 lying within each cell and secured, as by welding for example, to the webs 7 and the bolster 5. The cross-plates are suitably inclined so that they are substantially normal to the compression axes C of the blocks.

The sole bar 10 carries a cantilever plate 11 which is substantially parallel with the cross-plate 9 of the outer block 8 and the lower end of said block abuts the cantilever plate.

The transomes 6 of the bogie frame are connected by a bridge piece 12 which carries an upstanding plate 13, corresponding to the cantilever plate 11, and the inner block 8 abuts the plate 13 at its lower end and, as in the arrangement of the outer block, the plates 9 and 13 are substantially parallel and are normal to the compression axis of the associated block 8.

Each block 8 comprises a pair of rubber-like elements 14 and a metal plate 15 sandwiched therebetween, the plate 15 being provided to prevent undesirable distortion of the rubber blocks 8 as more fully set forth in Specification No. 648,516. It is to be understood that each of the rubber elements 14 may be provided with metal interleaves as set forth in Specification No. 648,516. To ensure that relative angular movement of the metal interleaves of each support block 8 is substantially reduced or eliminated the sandwich plate 15 of the pair of blocks are rigidly coupled together. As shown, each sandwich plate 15 is integral with a coupling plate 16 and therefore any tendency for relative angular movement of the metal interleaves of one support block is transmitted to the other support block and resisted thereby. Consequently said relative angular movement is substantially reduced or eliminated, more particularly since the probable nature of the angular movements for the blocks are in opposition to one another.

With the particular arrangement described: with reference to the drawings the bolster lies between the sole bars and in certain circumstances it may be found that the resultant transverse spring base is less than is desired and, in an alternative arrangement, to provide for a wider spring base the sole bar is lowered so that the bolster may pass over it. With this arrangement the pair of spring supports 8 at each end of the bolster may be arranged outside the sole bar. Alternatively, however, it may be arranged that the sole bar passes between the pair of springs, one being outside the sole bar and the other within the sole bar. With either of these arrangements a modified arrangement of stabilising plate 15, 16 would be provided, the general construction being, however, as described with reference to the drawing.

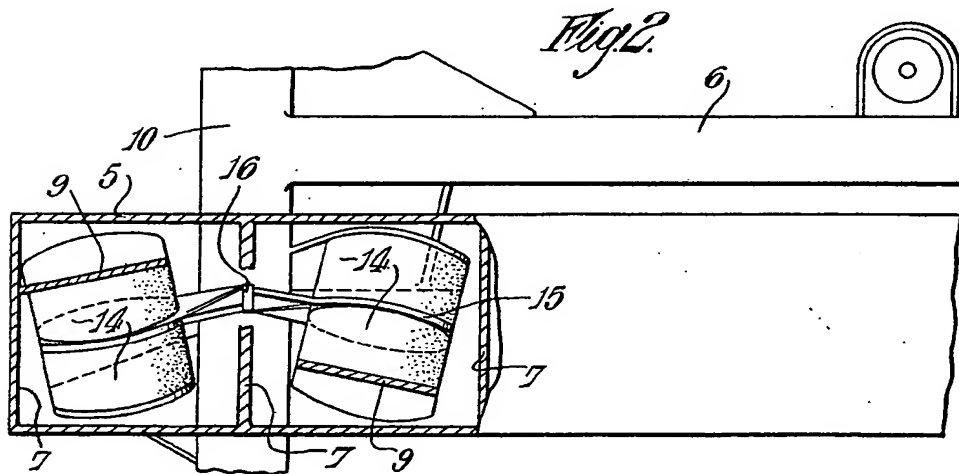
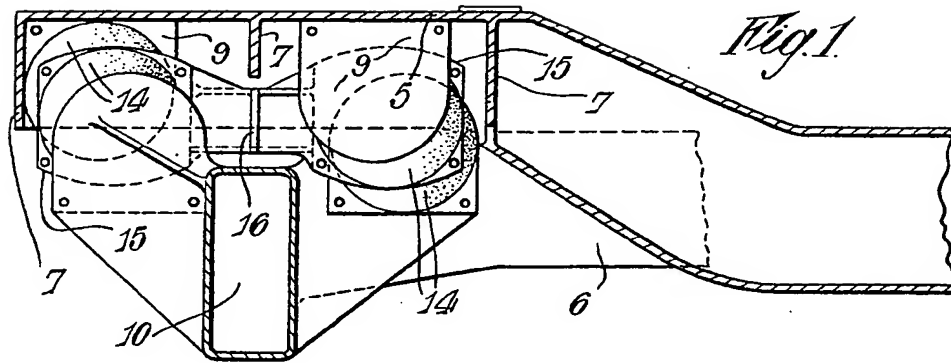
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Although the invention has particular application to supporting a bolster of a bogie carriage nevertheless it is not so limited and may be used on other vehicles or even with stationary loads.

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PROVISIONAL SPECIFICATION

1 SHEET

This drawing is a reproduction of  
the Original on a reduced scale.

